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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/781,795

02/20/2004

Yasuyuki Arai

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5184

31780 7590 01/24/2008
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EXAMINER

MATTHEWS, COLLEEN ANN

ART UNIT

PAPER NUMBER

2811

MAIL DATE

DELIVERY MODE

01/24/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/781,795

Applicant(s)

ARAI ET AL.

Examiner

Colleen A. Matthews

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-27, 61 and 62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-14 and 24-27 is/are allowed.
- 6) ☒ Claim(s) 1-9, 11, 15-23, 61 and 62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date 07/23/07.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama et al (Takayama) in view of U.S. Pub. No. 2002/0146893 to Shimoda et al. (Shimoda).

Regarding claim 1, Takayama discloses a semiconductor device comprising a thin film integrated circuit device (Figures 9A-9D), where the thin film integrated circuit comprises: a substrate (412); an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide; a first and second semiconductor film (104-108 in Figure 6A) over the insulating film, and a transistor comprising the second semiconductor film, a gate insulating film (118 in Figure 6B), and a gate electrode (Figure 6C elements 126-130) which are provided over the insulating film.

Takayama also discloses the ability for a device to be combined with a memory element (paragraph [0301]), however Takayama fails to explicitly disclose a memory comprising a first semiconductor film. Shimoda discloses a first semiconductor film used

as a memory (within thin film layer 4, paragraph [0119]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to have the first semiconductor film as a memory like in Shimoda in order to provide an integrated circuit capable of storing data.

Regarding claims 4 and 5, Takayama discloses a semiconductor device according to claim 1, where the first semiconductor film functions as an active region and as a channel region (paragraph [0217] and [0221])

Regarding claim 6, Takayama discloses an IC label comprising a thin film integrated circuit, where the thin film integrated circuit comprises: a substrate (412); an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide; a first and second semiconductor film (104-108 in Figure 6A) over the insulating film, and a transistor comprising the second semiconductor film, a gate insulating film (118 in Figure 6B), and a gate electrode (Figure 6C elements 126-130) which are provided over the insulating film.

Takayama also discloses the ability for a device to be combined with a memory element (paragraph [0301]), however Takayama fails to explicitly disclose a memory comprising a first semiconductor film. Shimoda discloses a first semiconductor film used as a memory (within thin film layer 4, paragraph [0119]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to

have the first semiconductor film as a memory like in Shimoda in order to provide an integrated circuit capable of storing data.

Regarding claim 15, Takayama discloses a container comprising a thin film integrated circuit, where the thin film integrated circuit comprises: a substrate (412); an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide; a first and second semiconductor film (104-108 in Figure 6A) over the insulating film, and a transistor comprising the second semiconductor film, a gate insulating film (118 in Figure 6B), and a gate electrode (Figure 6C elements 126-130) which are provided over the insulating film.

Takayama also discloses the ability for a device to be combined with a memory element (paragraph [0301]), however Takayama fails to explicitly disclose a memory comprising a first semiconductor film. Shimoda discloses a first semiconductor film used as a memory (within thin film layer 4, paragraph [0119]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to have the first semiconductor film as a memory like in Shimoda in order to provide an integrated circuit capable of storing data.

Regarding claim 16, Takayama discloses a container according to claim 15 as above. Takayama discloses where the thin film integrated circuit is covered by a label (407).

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama et al (Takayama) in view of U.S. Pub. No. 2002/0146893 to Shimoda et al. (Shimoda) and U.S. Pat. No. 6,703,267 to Tanabe et al (Tanabe).

Regarding claims 2-3, Takayama discloses a semiconductor device according to claim 1.

Takayama fails to disclose:

- the metal oxide as an oxide of an element selected from the group consisting of W, Ti, Ta, Mo, Nd, Ni, Co, Zr, Zn, Ru, Rh, Pd, Os, and Ir; an alloy containing the metal as a main component; or a chemical compound thereof or WO₂ or WO₃.

Tanabe teaches:

- a thin film integrated circuit device (Figure 11c) with the metal oxide as WO₂ or WO₃ (Column 3 line 24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to have the metal oxide as WO₂ or WO₃ as in Tanabe et al. in order to form a good interface between the metal oxide and the insulating layer.

Claims 7-8 and 18-19 are rejected under 35 U.S.C. 103(a) as being anticipated by U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pub. No. 2002/0146893 to Shimoda et al. (Shimoda) and U.S. Pat. No 6,885,032 to Forbes et al. (Forbes).

Regarding claims 7-8 and 18-19, Takayama discloses an IC label and a container with a thin film integrated circuit as above in claims 6 and 15.

Takayama fails to disclose:

- the IC label as contactless
- where the surface can be printed with a character, a letter, text, a symbol, or a diagram.
- where the thin film integrated circuit is held between a first label and a second label film and the second label is affixed to the thin film integrated circuit with an adhesive agent
- and the metal oxide adhered to the container

Forbes teaches:

- an IC label (Figure 2c element 16') as a contactless type (column 2 lines 39-47)
- a surface of the IC label (Figure 1 element 16) can be printed with a character, a letter, text, a symbol, or a diagram (Figure 1 element 14 and column 2 line 9-12).
- the thin film integrated circuit (Figure 2a element 20) is held between a first label (Figure 2b elements 22 and 24) and a second label film (Figure 5 element 32), and the second label is affixed to the thin film integrated circuit with an adhesive agent (Figure 5 element 36).
- and the metal oxide adhered to the container (Figure 1 and column 5 lines 11-19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made in order to allow the integrated circuit to be used for applications such as RFID tags.

Claims 9, 11, 20-21, 23, and 61-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pub. No. 2002/0146893 to Shimoda et al. (Shimoda) and U.S. Pat. No 6,885,032 to Forbes et al. and U.S. Pub. No. 2004/0256644 to Kugler et al.

Regarding claims 9 and 11, Takayama discloses an IC label comprising a thin film integrated circuit where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film. Takayama also discloses use of the label with an antenna (2906 in Figure 19A and 3006 in Figure 19B).

Takayama fails to disclose:

- the IC label comprising a contactless thin film integrated circuit.
- the antenna in a same layer as the gate electrode.
- the antenna with the same material as the gate electrode.
- the antenna comprising a conductive paste.

Forbes teaches:

- an IC label (Figure 2 element 16') comprising a contactless thin film integrated circuit (column 2 lines 39-47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to include a contactless thin film integrated circuit as in Forbes in order to allow the integrated circuit to be used for applications such as RFID tags.

Kugler et al. teaches:

- an antenna in the same layer as the gate electrode (page 7 paragraph 75 lines 6-7).
- the antenna formed from the same material as the gate electrode (page 2 paragraph 22 lines 5-8).
- the antenna comprising a conductive paste (page 7 paragraph 76 lines 3-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an antenna in the same layer as the gate electrode make the antenna with the same material as the gate electrode or a conductive paste to Takayama in order to provide an identification device with an active antenna that can be deposited on a substrate with conventional printing methods.

Regarding claims 20 and 23, Takayama discloses a container comprising a thin film integrated circuit where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3,

paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film. Takayama also discloses use of the container with an antenna (2906 in Figure 19A and 3006 in Figure 19B).

Takayama fails to disclose:

- the container comprising a contactless thin film integrated circuit.
- an antenna formed from the same material as the gate electrode
- the thin film integrated circuit held between a first label and a second label and the second label is affixed to the thin film integrated circuit with an adhesive agent.

Forbes teaches:

- an IC label (Figure 2c element 16') as a contactless type (column 2 lines 39-47)
- the thin film integrated circuit (Figure 2a element 20) held between a first label (Figure 2b elements 22 and 24) and a second label (Figure 5 element 32), and the second label is affixed to the thin film integrated circuit with an adhesive agent (Figure 5 element 36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to have a container comprising the contactless

thin film integrated circuit adhered to the container as in Forbes in order to attach the IC to a products such as cell phones or RFID tags.

Kugler et al. teaches:

- the antenna formed from the same material as the gate electrode (page 2 paragraph 22 lines 5-8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an antenna in the same layer as the gate electrode to further modify Takayama in order to provide an identification device with an active antenna that can be deposited on a substrate with conventional printing methods.

Regarding claim 21, Takayama as modified discloses a container according to claim 20 as above. Takayama discloses where the thin film integrated circuit is covered by a label (407).

Regarding claim 61: Takayama as modified discloses an IC label according to claim 9. The modification of Kugler further discloses wherein the gate electrode and the antenna are formed over the gate insulating film (both the antenna and gate electrode are in the same layer (paragraph [0022]) and a common plane (paragraph [0023])).

Regarding claim 62: Takayama as modified discloses an IC label according to claim 20. The modification of Kugler further discloses wherein the gate electrode and the antenna are formed over a gate insulating film (both the antenna and gate electrode are in the same layer (paragraph [0022]) and a common plane (paragraph [0023])).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Pub. No. 2003/0032210 to Takayama in view of U.S. Pub. No. 2002/0146893 to Shimoda et al. (Shimoda) and U.S. Pub. No. 2002/0027247 to Arao et al.

Regarding claim 17, Takayama discloses a container according to claim 16 as outlined above.

Takayama fails to disclose:

- the protective film having a DLC or CN film

Arao et al. teaches:

- a protective film of DLC (Figure 10B element 704) provided on a thin film integrate circuit.

It would have been obvious to one of ordinary skill in the art at the time the invention was made use the DLC film of Arao et al. as the protection layer in Takayama in order to prevent the invasion of oxygen as well as water and also to mechanically protect the thin film integrated circuit.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Pub. No. 2003/0032210 to Takayama in view of U.S. Pub. No. 2002/0146893 to Shimoda et al. (Shimoda) and U.S. Pat. No 6,885,032 to Forbes et al. and U.S. Pub. No. 2004/0256644 to Kugler et al in further view of U.S. Pub. No. 2002/0027247 to Arao et al (Arao).

Regarding claim 22, Takayama as modified teaches a container according to claim 21 as outlined above.

Takayama fails to disclose:

- the protective film having a DLC or CN film

Arao et al. teaches:

- a protective film of DLC (Figure 10B element 704) provided on a thin film integrate circuit.

It would have been obvious to one of ordinary skill in the art at the time the invention was made use the DLC film of Arao et al. as the protection layer in Takayama in order to prevent the invasion of oxygen as well as water and also to mechanically protect the thin film integrated circuit.

Allowable Subject Matter

Claims 12-14 and 24-27 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claims 12 and 24, the prior art fails to anticipate or render obvious the thin film integrated circuit with the limitations including an antenna provided on the interlayer insulating film.

Response to Arguments

Applicant's arguments filed 11/02/2007 have been fully considered but they are not persuasive.

Applicant argues (Remarks page 10 paragraph 1 and page 11 paragraph 2) that it "does not appear that Shimoda discloses a memory comprising a semiconductor film." Examiner disagrees. Shimoda's disclosure is directed to thin films of semiconductor layers, as evident by for example paragraph [0003] disclosing use of materials such as silicon. Paragraph [0119] recites "transferred layer 4 be a thin film, and particularly a function thin film or thin film device" (lines 4-6). One of ordinary skill in the art would understand these thin films to include semiconductor thin films. Paragraph [0119] further states that an example of the functional thin film includes "memories" (line 11). One of ordinary skill in the art would understand the language of Shimoda, which also recites the the examples are not limited, to encompass thin films of semiconductor layers in a memory device.

Applicant argues (Remarks page 10 paragraph 3) that Takayama does not teach or suggest an IC label or container. Examiner notes that in claims 6 and claims 15 the references of "IC label" and "container" are contained within the preamble. Therefore the recitations have not been given patentable weight. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant argues (Remarks page 12 paragraph 2-3, page 13, and page 14) that the examiner has not provided a teaching suggesting or motivation to combine

references. The examiner disagrees. Applicant argues (page 12 paragraph 5) that the logic of modifying Takayama with Forbes to provide RFID tags is circular is not persuasive. The fact that Forbes taught the application of RFID tags at the time the invention was made is sufficient motivation for one of ordinary skill in the art to have explored the application in combination with Takayama. Applicant argues (Remarks page 14 paragraph 2) that Takayama's antenna and gate electrode are not provided over the same substrate. This is agreed with by the examiner. The combination with Kugler modifies Takayama such that the antenna is on the same substrate as the gate electrode and one would have been motivated to do so at the time of the invention to provide RFID capabilities as mentioned in Kugler (paragraph [0001]) while also using conventional manufacturing methods. Applicant argues (Remarks page 14 paragraph 4) that one would not have had a reasonable expectation of success in combining references. This is not persuasive. The prior art of Takayama discloses a known semiconductor device and the applied references of, Tanabe, Forbes and Kugler are applying additional known techniques (data storage, RFID applications, etc) to improve the device of Takayama.

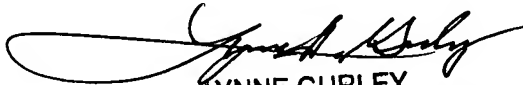
Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen A. Matthews whose telephone number is 571-272-1667. The examiner can normally be reached on Monday - Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


LYNNE GURLEY
SUPERVISORY PATENT EXAMINER
AU 2811, TC 2802

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